AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A method of decoding a constellation transmitted on subchannels of orthogonal frequency division multiplexed (OFDM) symbols in a ~~(2×2)~~ ~~WLAN~~wireless communication system--,--[[;]] the method comprising ~~the steps of~~:

receiving a signal comprising a constellation of transmitted OFDM symbols;

decoding ~~the~~an OFDM symbol having ~~the~~a higher signal-to-noise ratio (SNR) among the received OFDM symbols;

estimating the probability that ~~the~~a correct OFDM symbol has been decoded;

decoding the next higher SNR OFDM symbol via linear minimum mean-squared error estimation (LMMSE) processing if the probability of error exceeds a predetermined threshold; and

subtracting the contribution of decoded symbol from the received signal followed by decoding the next higher-SNR OFDM symbol via iterative minimum mean-squared error estimation (IMMSE) processing if the probability of error does not exceed the predetermined threshold.

2. (Currently Amended) The method according to claim 1, wherein the constellation of transmitted OFDM symbols is selected from ~~the~~a group consisting of BPSK symbols, and QPSK symbols.

3. (Currently Amended) The method according to claim 1, wherein ~~the step of~~ decoding the OFDM symbol having the higher SNR among the received OFDM symbols comprises decoding via LMMSE signal processing.

4. (Currently Amended) The method according to claim 1, wherein ~~the step of~~ decoding the OFDM symbol having the lower SNR among the received OFDM symbols comprises decoding via maximal-ratio combining.

5. (Currently Amended) The method according to claim 1, wherein ~~the step of~~ estimating the probability that the correct OFDM symbol has been decoded comprises estimating a function metric selected from the group consisting of additive noise variance, propagation channel matrix, and minimum mean-squared error (MMSE) interference noise power.

6. (Currently Amended)The method according to claim 1, wherein ~~the step of~~ decoding the next OFDM symbol via LMMSE processing if the probability of error exceeds a predetermined threshold comprises estimating whether

$$P_{e|\bar{s}} = \frac{e^{-|\bar{s}|/\sigma^2}}{e^{-|\bar{s}|/\sigma^2} + e^{\bar{s}/\sigma^2}}$$

is greater than a predetermined threshold, wherein σ^2 is the minimum mean-squared error (MMSE) interference noise power of the first-stage symbol, and further wherein $\bar{s}$ represents the first-stage detected symbols prior to hard slicing.

7. (Currently Amended) The method according to claim 1, wherein ~~the step of~~ decoding the next OFDM symbol via IMMSE processing if the probability of error does not exceed the predetermined threshold comprises estimating whether

$$P_{e|\bar{s}} = \frac{e^{-|\bar{s}|/\sigma^2}}{e^{-|\bar{s}|/\sigma^2} + e^{\bar{s}/\sigma^2}}$$

is not greater than a predetermined threshold, wherein σ^2 is the minimum mean-

squared error (MMSE) interference noise power of the first-stage symbol, and further wherein $\bar{s}$ represents the first-stage detected symbols prior to hard slicing.

8. (Currently Amended) A hybrid iterative minimum mean-squared error estimation-linear minimum mean-squared error estimation (IMMSE-LMMSE) receiver comprising:

an interference cancellation first stage operational to receive a constellation of transmitted orthogonal frequency division multiplexed (OFDM) symbols and decode the OFDM symbol having ~~the~~a higher signal-to-noise ratio (SNR) among the received OFDM symbols;

algorithmic software to estimate the probability that the correct OFDM symbol has been decoded;

an LMMSE processing stage operational to decode the next OFDM symbol via LMMSE processing if the probability of error exceeds a predetermined threshold; ~~and~~

nulling means for subtracting the contribution of decoded symbol from the received signal followed by decoding the next higher-SNR OFDM symbol via IMMSE processing if the probability of error does not exceed the predetermined threshold; and

an IMMSE processing stage operational to decode the next OFDM symbol via IMMSE processing if the probability of error does not exceed the predetermined threshold.

9. (Currently Amended) The hybrid IMMSE-LMMSE receiver according to claim 8, wherein the algorithmic software to estimate the probability that the correct OFDM symbol has been decoded is configured to estimate a function

metric selected from the group consisting of additive noise variance, propagation channel matrix, and minimum mean-squared error (MMSE) interference noise power.

10. (Currently Amended) ~~The~~A hybrid iterative minimum mean-squared error estimation-linear minimum mean-squared error estimation (IMMSE-LMMSE) receiver ~~according to claim 8,~~ comprising:

an interference cancellation first stage operational to receive a constellation of transmitted orthogonal frequency division multiplexed (OFDM) symbols and decode the OFDM symbol having the higher signal-to-noise ratio (SNR) among the received OFDM symbols;

algorithmic software to estimate the probability that the correct OFDM symbol has been decoded;

an LMMSE processing stage operational to decode the next OFDM symbol via LMMSE processing if the probability of error exceeds a predetermined threshold; and

an IMMSE processing stage operational to decode the next OFDM symbol via IMMSE processing if the probability of error does not exceed the predetermined threshold,

wherein the algorithmic software to estimate the probability that the correct OFDM symbol has been decoded is configured to estimate whether a metric defined by

$$P_{e|\tilde{x}} = \frac{e^{-|\tilde{x}|/\sigma^2}}{e^{-|\tilde{x}|/\sigma^2} + e^{\tilde{x}/\sigma^2}}$$

is greater than a predetermined threshold, wherein σ^2 is the minimum mean-squared error (MMSE) interference noise power of the first-stage symbol, and further wherein $\bar{x}$ represents the first-stage detected symbols prior to hard slicing.

11. (Currently Amended) ~~The~~A hybrid iterative minimum mean-squared error estimation-linear minimum mean-squared error estimation (IMMSE-LMMSE) receiver ~~according to claim 8,~~ comprising:

an interference cancellation first stage operational to receive a constellation of transmitted orthogonal frequency division multiplexed (OFDM) symbols and decode the OFDM symbol having the higher signal-to-noise ratio (SNR) among the received OFDM symbols;

algorithmic software to estimate the probability that the correct OFDM symbol has been decoded;

an LMMSE processing stage operational to decode the next OFDM symbol via LMMSE processing if the probability of error exceeds a predetermined threshold; and

an IMMSE processing stage operational to decode the next OFDM symbol via IMMSE processing if the probability of error does not exceed the predetermined threshold,

wherein the algorithmic software to estimate the probability that the correct OFDM symbol has been decoded is configured to estimate whether a metric defined by

$$P_{e|\bar{x}} = \frac{e^{-|\bar{x}|/\sigma^2}}{e^{-|\bar{x}|/\sigma^2} + e^{\bar{x}/\sigma^2}}$$

is not greater than a predetermined threshold, wherein σ^2 is the minimum mean-squared error (MMSE) interference noise power of the first-stage symbol, and further wherein $\bar{s}$ represents the first-stage detected symbols prior to hard slicing.